

CLAIMS

1.

A method of transmitting message data from a first one of a plurality of stations in a network to a second one of the plurality of stations, the method comprising:

monitoring, at the first station, the activity of other stations in the network;

transmitting the message data to at least one opportunistically selected intermediate station for onward transmission to the second station; and

transmitting confirmation data back from the at least one intermediate station to the first station, indicative of the onward transmission of the message data.

2.

A method according to claim 1 wherein each station in the network monitors the activity of other stations on an ongoing basis in order to determine the availability of those other stations, according to predetermined criteria, as intermediate or destination stations.

3.

A method according to claim 2 wherein the monitoring is carried out by receiving data transmitted by the other stations, and analysing the received data transmissions to select an intermediate or destination station.

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4.

A method according to claim 3 including extracting information from the received data indicating at least the identity of the other stations.

5.

A method according to claim 4 including extracting information from the received data relating to the destination and/or the origin of message data transmitted to or received from the other stations.

6.

A method according to claim 5 including extracting information from the received data relating to the final destination and/or primary origin of the message data.

7.

A method according to ~~any one of claims 4 to 6~~ ^{claim 4} including extracting information from the received data relating to the propagation delay of each message, the data rate of each message and/or the volume of messages between any two or more stations.

8.

A method according to ~~any one of claims 3 to 7~~ ^{claim 3} wherein data transmitted by each station includes time data, the monitoring including determining the age of data transmissions received from other stations in the network and discarding data transmissions older than a predetermined age.

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A method according to claim 8 including comparing the time data in the received data transmissions with a reference time, and discarding the received data transmissions a predetermined period after the reference time.

10.

A method according to claim 8 or claim 9 including allocating a priority to received data transmissions, and adjusting the order of retransmission of the received data transmission to other stations according to the age thereof.

11.

claim 1
A method according to ~~any one of claims 1 to 10~~ including monitoring the quality of the signal path between the first station and one or more of the other stations and adapting, according to predetermined criteria, at least one parameter of a subsequent transmission to another station in accordance with the monitored quality of the signal path to increase the probability of the transmission being received successfully.

12.

A method according to claim 11 including extracting information from the received data relating to the quality of the transmission path between any two or more of the other stations.

13.

claim 4
A method according to ~~any one of claims 4 to 12~~ including deriving from the received data adaptation information for use in adapting, according to at least one predetermined criterion, at least one parameter of a subsequent transmission to another station to increase the probability of the transmission

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being received successfully.

14.

A method according to claim 13 wherein the adaptation information is transmitted to one or more other stations in an adaptation signal, the one or more other stations being responsive to the adaptation signal to vary at least one parameter of a subsequent transmission therefrom.

15.

A method according to claim 13 or claim 14 wherein the parameter which is adapted is one or more of the data rate, transmission power, transmission frequency, transmission or reception antenna, message length, message priority, message time to live, time of transmission, and message retransmission rate.

16.

a *claim 1*
A method according to ~~any one of claims 1 to 15~~ wherein the monitoring further includes transmitting a probe signal from the first station to at least one intermediate station, the probe signal containing at least address data identifying the first station, and transmitting an acknowledgement signal from the at least one intermediate station to the first station.

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A communication network comprising a plurality of stations each able to transmit and receive message data, each station comprising:

transmitter means for transmitting data to other stations;

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~~receiver means for receiving data from other stations;~~

monitoring means for monitoring at least one characteristic of respective channels between a first station and other stations;

decision means for selecting another station as an intermediate station for onward transmission of message data from the first station to a destination station; and

control means for adjusting at least one parameter of a transmission signal transmitted by the transmitter means according to the monitored at least one characteristic of the respective channel to increase the probability of the transmission signal being received successfully by the selected intermediate station.

18.

A communication network according to claim 17 wherein the monitoring means of each station is adapted to analyse data in signals received from other stations to select the intermediate station.

19.

A communication network according to claim 18 wherein the control means is adapted to monitor the age of data transmissions received from other stations in the network and to discard data transmissions older than a predetermined age.

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A communication network according to claim 19 wherein the control means is arranged to include time data in each data transmission, to monitor the age of received data transmissions by comparing time data therein with a reference time, and to discard the received data transmissions a predetermined period after the reference time.

21.

A communication network according to claim 20 wherein the control means is arranged to allocate a priority to received data transmissions and to adjust the order of retransmission of the received data transmissions to other stations according to the age thereof.

22.

A communication network according to any one of claims 18 to 21 wherein each station includes storage means for storing data in the received signals relating to the identity of the other stations, and processor means for determining the quality of the signal path between the receiving station and each of the other stations.

23.

A communication network according to any one of claims 17 to 22 wherein the monitoring means is adapted to generate a probe signal for transmission to other stations, the probe signal containing at least address data identifying the originating station; and to receive an acknowledgement signal from other stations receiving the probe signal.

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claim 17

A communication network according to any one of claims 17 to 23 wherein the control means is adapted to vary the data rate, transmission power, transmission frequency, transmission or reception antenna, message length, message priority, message time to live, time of transmission, message retransmission rate, and/or other parameters of its transmission to the selected intermediate station.

25.

Communication apparatus for use as a station in a communication network comprising a plurality of stations each able to transmit and receive message data, the communication apparatus comprising:

transmitter means for transmitting data to other stations;

receiver means for receiving data from other stations;

monitoring means for monitoring at least one characteristic of respective channels between the apparatus, operating as a first station, and other stations;

decision means for selecting another station as an intermediate station for onward transmission of message data from the first station to a destination station; and

control means for adjusting at least one parameter of a transmission signal transmitted by the transmitter means according to the monitored at least one characteristic of the

~~respective channel to increase the probability of the transmission signal being received successfully by the selected intermediate station.~~

26.

Communication apparatus according to claim 25 wherein the monitoring means is adapted to analyse data in signals received from other stations to select the intermediate station.

27.

Communication apparatus according to claim 26 including storage means for storing data in the received signals relating to the identity of the other stations, and processor means for determining the quality of the signal path between the receiving station and each of the other stations.

28.

Communication apparatus according to any one of claims 25 to 27 wherein the monitoring means is adapted to generate a probe signal for transmission to other stations, the probe signal containing at least address data identifying the originating station; and to receive an acknowledgement signal from other stations receiving the probe signal.

29.

Communication apparatus according to ~~any one of claims 25 to 28~~ wherein the monitoring means is adapted to vary the data rate, transmission power, transmission frequency, transmission or reception antenna, message length, message priority, message time to live, time of transmission, message ~~retransmission rate, and/or other parameters of its transmission to the~~

~~selected intermediate station~~

30.

Communication apparatus according to claim 29 wherein the monitoring means comprises power sensing means and controllable attenuator means responsive to power control signals derived from an output of the power sensing means to attenuate received and/or transmitted signals to within predetermined levels.

31.

Communication apparatus according to claim 30 wherein the controllable attenuator means comprises a plurality of resistive elements and a plurality of associated solid state switch elements responsive to the power control signals and arranged to connect the resistive elements to, or disconnect them from, the signal path.

32.

Communication apparatus according to claim 30 or claim 31 wherein the control means is adapted to adjust the transmission power of the transmission signal in response to the measured power of a received signal.

33.

Communication apparatus according to claim 32 wherein the control means includes current or power sensing means for monitoring the transmission power of the transmission signal, comparison means for comparing the transmission power with the measured power of a received signal and for generating a transmission power control signal, and controllable driver means in the transmitter means responsive to the transmission power control

~~signal to adjust the transmission power towards a value having a predetermined relationship with the measured power of the received signal.~~

34.

claim 29

Communication apparatus according to ~~any one of claims 29 to 33~~ wherein the monitoring means includes demodulator means operable at a plurality of predetermined data rates, thereby to demodulate received data at any one of the predetermined data rates.

35.

Communication apparatus according to claim 34 wherein the demodulator means comprises a plurality of demodulators arranged in parallel and each operating at a respective different predetermined data rate.

36.

Communication apparatus according to claim 35 wherein the demodulator means further comprises selection means for monitoring the outputs of the parallel demodulators and for selecting an output which is delivering validly demodulated data.

37.

claim 25

Communication apparatus according to ~~any one of claims 25 to 36~~ including processor means and associated vocoder means for converting speech to data for transmission and for converting received data to speech.

38.

Communication apparatus according to claim 37 wherein the vocoder means ~~comprises at least two vocoders arranged in parallel and operable at different~~

~~data rates, the processor means being operable to select data from the vocoders for transmission according to the monitored at least one characteristic of the channel.~~

39.

Communication apparatus according to claim 38 wherein the at least two vocoders are operable independently to convert a speech signal to respective different data signals at different data rates or using different vox settings, the processor means being operable to select any one of the different data signals for transmission.

40.

Communication apparatus according to claim 38 or claim 39 wherein the processor means is operable to output received data to a selected one or more of the vocoders at a rate selected to convert the received data to speech according to predetermined criteria.

41.

Communication apparatus according to claim 40 wherein the processor means is operable to add or remove data selectively from the received data output to the selected one or more of the vocoders to control the rate at which a speech signal represented by the received data is replayed.

42.

claim 38
Communication apparatus according to ~~any one of claims 38 to 41~~ wherein the at least two vocoders are operable independently, at least one to convert a speech signal to data for transmission, and at least one to simultaneously convert received data to speech.

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23. *claim 25*
Communication apparatus according to any one of claims 23 to 12 wherein the control means is adapted to monitor the age of data transmissions received from other stations in the network and to discard data transmissions older than a predetermined age.

44.

Communication apparatus according to claim 43 wherein the control means is arranged to include time data in each data transmission, to monitor the age of received data transmissions by comparing time data therein with a reference time, and to discard the received data transmissions a predetermined period after the reference time.

45.

Communication apparatus according to claim 44 wherein the control means is arranged to allocate a priority to received data transmissions and to adjust the order of retransmission of the received data transmissions to other stations according to the age thereof.